Study on VOC-emissions of indoor plasters with organic binders according to standard DIN EN 15824

1 Initial situation

Results derived from a research project funded by the federal environmental agency (UBA) indicated that, considering users' health, the use of synthetic resin plasters (according to DIN EN 15824) in recreation rooms may not be unproblematic, because measured emission values partly exceeded strongly the limits of the AgBB (CHEBB)-Evaluation-Scheme. The question raised whether - for the reason of health protection - it should be necessary to test plasters with organic binders used for the construction of recreation rooms and if so which plaster types should be considered. This should be clarified by the present study.

2 Demands on the study

- Elaboration of differences of several plasters defined in the standard DIN EN 15824 regarding their ingredients.
- Clarification of the question whether biocides and flame retardants are used.
- Gathering VOC-emission data for plasters with organic binders (synthetic resin plaster, silicate plaster, silicone resin plaster).
- Comparison of available VOC-emission data with available VOC-emission data for mineral plasters.
- Provision of a decision basis if and which products according to standard DIN EN 15824 are suitable for indoor use.

3 Procedure

Following a general literature research regarding VOC-emissions from plasters with organic binders, manufacturers' specifications were analysed. These specifications were taken from the material safety data sheets (MSDS) and the technical data sheets. Data of 23 manufacturers with about 100 dispersion plasters, 41 silicate plasters and 36 silicone resin plasters were evaluated.

4 Results

- 3 different plaster types exist (dispersion plaster, silicate plaster and silicone resin plaster). Plasters for indoor use are mostly dispersion plasters. There is no silicone plaster solely used for interior application.
- Dispersion plasters showed the highest variety with respect to the number and the content of organic components.
- Despite intensive literature research and inquires with manufactures, no detailed information concerning ingredients and formulation could be obtained. These data were classified as company secret. Statements of most manufacturers regarding solvent and softener content are only based on the knowledge of the composition derived from the suppliers' specifications concerning solvent and softener.

- Approximately one fifth of the examined dispersion plasters for indoor use contain preservatives. No indication was found that indoor plasters were equipped with algaecidal and fungicidal agents.
- Approximately 40 % of the examined plasters for outdoor use contain preservatives and in approx. one fourth an indication of a special algaecidal and fungicidal finish could be found.
- Voluntary emission test chamber experiments were carried out by two manufacturers only. Results of the UBA-research project demonstrate the necessity to analyse organic bound plasters for their VOC-emissions into indoor air, because in 4 out of 6 cases the limits of the AgBB-Evaluation-Scheme were exceeded.
- Emission values of mineral plasters in contrast do not exceed the limits given by the AgBB-Evaluation-Scheme.

5 Recommendation

Current data do not support a decision whether plasters with organic binders (according to standard DIN EN 15824) for indoor use have to be approved by DIBt ("Deutsches Institut für Bautechnik"). To satisfy health protection standards on one hand and to spare manufacturers from time and cost intensive emission test chamber experiments on the other hand, the implementation of a research project is suggested. Aim of this project should be, to gain knowledge on the emission potential of organic bound plasters by means of evaluating a representative cross section of commercially available products.